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CONTENTS

Original Papers

Reoccurring Convergence Insufficiency. Carel C. Koch..... 262
An Esotropia Caused by a Brain Tumor. Walter B. Lyon..... 269
Elementary Phenomena of Light from Romer to Relativity. William H. Blakey..... 270
On the Bagwell Theory of Non-Pathological Nystagmus. Arthur H. Bush 273

Editorials

The American Academy of Optometry and the A. O. A..... 275
Prescribe Optical Appliances..... 278
Public Recognition of the Optometrist..... 279

In Memorium

William S. Todd..... 279

Abstract Department

The Snellen Symbol and Visual Value. J. A. C. Gabriels..... 280
Suspension of the Fusion Impulse as a Therapeutic Measure. E. M. Alger..... 280
Glaucoma. P. Smith..... 280
Myopia. E. Hippel..... 281
The Effect of Motion Pictures on the Eye. G. A. Henry..... 281
A Bifocal for the Sculptor and Painter. E. LeRoy Ryer and E. E. Hotaling 281
Bifocal Adjustment. P. N. Hansen..... 281

Special Report

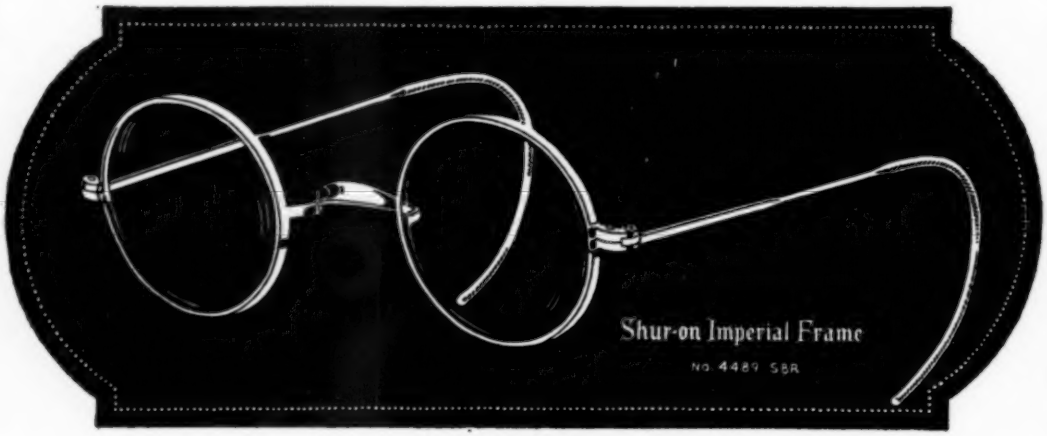
Retailing Wholesalers. Wm. Smith..... 282

Book Review

The City of Open Air and Other Verse. Charles P. Cleaves..... 284

Reports and Announcements of Societies

North Dakota Convention..... 284
Minnesota Bulletin 285



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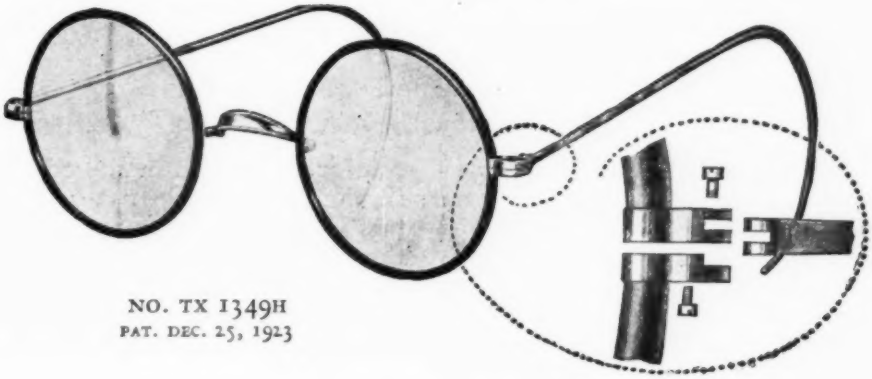

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AMERICAN JOURNAL OF OPTOMETRY
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REOCCURRING CONVERGENCE INSUFFICIENCY

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The following eight cases of Reoccurring Convergence Insufficiency are here reviewed in some detail. This, the writer believes necessary inasmuch as many optometrists are now prescribing oculo-prism treatments for cases of Convergence Insufficiency and for cases of Exophoria. This form of technic is still rather new and still very much in its experimental stages, and while much good has already come from these treatments, we still have much to learn regarding the causes and effects of these near point disorders.

Reoccurring Convergence Insufficiency presents what is at least to the writer, a new phase of this subject and one but lightly touched upon in our literature.

Case 1.

Patient, Miss A. A., age 21, first came to me in the spring of 1922. She complained of an inability to do prolonged close work and while she said she saw things perfectly, she was, nevertheless, quite distressed in doing her office work. She appeared to be in perfect health, having had no previous ill spells. Her teeth, according to her dentist with whom I talked, were in good shape. Her tonsils had been removed some two years before and her nose and throat were normal.

Upon examining her I found the media and fundus of each eye normal, no refractive errors of any sort present and the accommodation was also normal. The phoria tests indicated an orthophoria both for distance and near but I did find that her adduction was quite low. In fact she could not overcome 12 prism dioptres base out at 6 meters nor more than 10 prism dioptres base out at 36 centimeters, her working distance.

Here was a true case of convergence insufficiency and I at once prescribed oculo-prism treatments, twenty-one of which were given. At the time of the fifth treatment she reported that all symptoms had disappeared and that she was doing her nearpoint work with comfort. The treatments continued until she could shock-fuse 48 prism dioptres base out with ease. At the end of the treatments she showed 3½ degrees of esophoria. She was then discharged.

In July, 1923, she returned, saying that the old trouble had, about two weeks before, returned, and after talking the matter over with her parents had decided to come in for additional treatments. This rather surprised me and after a thorough examination of her eyes I was somewhat taken back to find her adduction again low, it this time being but 12 to 14 prism dioptres. I then suggested a physical examination which was at once made but all tests were negative. X-Ray plates were then made of all of her teeth but these also with negative results.

Oculo-prism treatments were again resorted to and the case returned to normal in six treatments, the symptoms again disappearing. She was instructed to return at the first reoccurrence of the symptoms and has had to do this in July, 1924, again in November, 1925, and the fourth time in October, 1926. Each time she returns I find the convergence again low and each time she is suffering as before. From five to eight oculo-prism treatments give relief and the patient is apparently quite satisfied with the way things are going. She is now 26 years old and holds a very responsible secretarial position. Her health is splendid and with the exception of the trouble caused by the reoccurring convergence weakness never experiences an ill moment.

Case 2.

Patient, Miss S. R., age 22, at the time of first visit in 1924. Occupation, needle worker in laundry. Patient came in complaining of headaches, dizziness and an inability to comfortably do eight hours close work. I found no refractive error, no pathology, no accommodative disturbance and an orthophoria at the distant and near point. Her convergence was low but she had

five or six very bad looking teeth and I insisted she have these taken care of before an ocular diagnosis was made. This dental work was done, five teeth being extracted. All of these were abscessed and in poor shape, she requiring dental treatments for three weeks.

At the end of this time her visual condition had not in any way improved as I had hoped, so oculo-prism treatments were prescribed, twenty-nine of these treatments being given. The symptoms were entirely relieved before the tenth treatment and the patient's converging ability built up to what seemed at the time to be a nice reserve, her adduction being between 55 and 60 prism dioptres. She was quite comfortable and claimed to be really enjoying her work for the first time.

She returned in the fall of 1926 saying that after her summer vacation the old symptoms were beginning to return and that she now felt just as she had before the initial treatments were given. Upon re-examining her I found that matters regarding her eyes were very much in the same condition as previously recorded. Normal vision. No ocular pathology. No refractive error. Orthophoria or nearly so at a distance, the patient at times seemed to have ¼ to ½ degree of esophoria, with an orthophoria condition at the near point. No accommodative disturbance but a decided convergence insufficiency.

Oculo-prism treatments were again prescribed, the patient responding splendidly and after twelve treatments and a post-refraction she was discharged, the convergence again showing what appeared to be at least a normal reserve, the symptoms having during the treatment period been relieved.

Case 3.

Patient, Mr. J. B., age 28 in February, 1925, when he first came to me. Symptoms were headaches and eyes grew tired while at work. His occupation was bank teller, and his work was largely done under artificial light. This artificial illumination seemed rather trying, he said. Upon examination I found him slightly hyperopic, accepting nicely O. U. plus 0.50 D. Sph., for near work. There was no accommodative disturbance and an orthophoria at both distance and near. His convergence however was low, he being unable to overcome more than 15 prism dioptres. I prescribed optical appliances, O. U. plus 0.50 D. Sph., for him along with oculo-prism treatments.

Fifteen treatments had his adduction to 45 prism dioptres and his symptoms had disappeared.

He returned in July of the following year saying that about a month previous his old trouble had started again. The examination revealed little change in the hyperopia nor in the accommodative balance. His ductions were however found to be again low, indicating the return of the convergence insufficiency. No change was made in his correction at this time but oculo-prism treatments were again resorted to, the symptoms at once disappearing as the power of adduction increased. Eight treatments were sufficient to return the case to normal.

Just one year later (July, 1927) he returned, saying he felt the need of some change, either stronger lenses or additional treatments. My skiascopic examination indicated that additional plus would be beneficial and his correction was changed to O. U. plus 1.00 D. Sph. His ductions again being low, oculo-prism treatments were administered for the third time with the usual satisfactory results. Nine treatments being given.

Case 4.

Patient, Miss E. C., age 17 in October, 1924, when she first came to my office. Symptoms were dizziness accompanied by fainting spells when practicing at the piano, a thing she seemed fond of doing, as she spent at least four hours per day in that way. She was also enrolled as a student in one of the local high schools, where she received very high marks. Patient was somewhat underweight but otherwise well and came to me upon the recommendation of their family physician to whom they had taken her when the fainting spells had started some two months before. He though had found nothing wrong. She had experienced three of these spells and considerable nausea and dizziness during this period.

Upon examining the case I found no refractive error, no signs of any ocular pathology, normal accommodation and normal phorias with a very low convergence reserve. In fact the latter bordered upon an insufficiency, she be-

ing able to overcome but 18 prism dioptres at the near point. Oculo-prism treatments were prescribed, and while the writer is always careful not to oxertax the internal recti muscles, particularly during the earlier treatments, this patient fainted during the first treatment and again during the third. The treatments which were given every forty-eight hours for the first ten days made it impossible for her to attend her classes and little or no improvement was shown in either her convergence reserve or in the way she felt. At the end of the fifth treatment I prescribed a correction consisting of a pair of ¾ degree plano-prisms base out to be used as much of the time as possible, the treatments to be given from this point on every day.

During the sixth, seventh and eighth treatment she claimed she felt somewhat improved. She was using the optical appliances which had been prescribed about one-half of the time, with but little discomfort and as she was now back at school with naturally some work to make up, all practicing at the piano was temporarily discontinued.

At the end of the fifteenth treatment her adduction was 30 prism dioptres and she had experienced no dizziness for the past 48 hours. Progress was splendid from this point on and ten additional treatments increased her convergence reserve to 60 prism dioptres, when the use of the prismatic correction was discontinued.

The case remained under observation for the next month, the patient during this period experiencing no discomfort and the convergence reserve staying at about the high point reached during the treatments. Her music work was also taken up again without any reoccurrence of the fainting or dizzy spells.

The patient returned two years later, November, 1926, saying she had had two or three headaches and a bit of dizziness within the past week and was afraid of a relapse. She was now a student in a large school of music and frequently spent at least five hours a day at the piano.

Examination revealed a decided convergence insufficiency, her adduction being but 15 prism dioptres. All the other ocular factors were again found to be normal. Oculo-prism treatments were again successfully prescribed, ten treatments being given the patient, who has felt no discomfort since that time.

Case 5.

Patient, Mr. C. J., age 34, occupation Instructor in a Private Boys' School. Complains of a visual fatigue when correcting papers or doing much reading. The trouble started in October, 1925, and he came in about one month after this date. He claimed his health was perfect having had a physical examination just a few weeks before at the close of a boys' camp in which he had spent the summer in the capacity of a tent squad leader.

His ocular examination revealed 100% visual acuity, O. D., or O. S., no ocular pathology, no refractive error or accommodative disturbance being present. Orthophoria at distance and near with an adduction of but 8 prism dioptres.

Fifteen oculo-prism treatments eliminated the convergence insufficiency, bringing his adduction up to 40 prism dioptres. At this point his eyes were giving him no trouble so he was discharged.

Just a year later he returned saying the symptoms were returning. A reexamination was made, the findings being about the same as those recorded on the first visit, and a diagnosis made of Reoccurring Convergence Insufficiency. Seven treatments increased the convergence reserve to a normal point, some 44 prism dioptres, which left the patient again in comfort.

Case 6.

Patient, Mrs. J. S., age 31. Occupation housewife. Case first came to me in 1923. Near point work seemed difficult. Her health was good and no ocular pathology was found. Upon examining her I found the visual acuity to be normal, no astigmatism, her static skiametry findings were O. U., plus 0.75 D. Sph., the dynamic readings being O. U., plus 1.50 D. Sph. Her near point of accommodation was normal and there was an orthophoria at both distance and near. Her ductions were, adduction 18 prism dioptres, and her abduction 8 prism dioptres. Optical appliances, O. U., plus 0.75 D. Sph., were prescribed for near point work. This gave relief for about

sixty days when the symptoms returned.

Upon reexamining the case the same findings were revealed, with the exception of the adduction which was now 14 to 15 prism dioptres. Oculo-prism treatments were then prescribed in addition to the near point correction and a convergence reserve built up in sixteen treatments. She felt much improved and wished to discontinue the use of the reading correction, however I advised against this. At the close of the treatment period her adduction was able to overcome 42 prism dioptres.

In the spring of 1925 she returned saying that during the past two weeks reading seemed difficult, although sewing did not bother her. The third examination disclosed no new data. Her eyes were substantially in the same condition as on the previous visit. She had been using her correction for all near point work and no material change in this, was necessary. Her convergence reserve, however, had been materially reduced, it being now between 16 and 20 prism dioptres. Ten oculo-prism treatments returned this convergence insufficiency to normal and the patient's reading periods were conducted with ease.

In June of this year the patient again returned. She had experienced no trouble at all until some ten days before when she had assisted in doing some near point lodge work.

Upon examining the case I found her hyperopia had increased so as to permit the acceptance of a pair of plus 1.00 D. Sph., for close work as well as to permit their use as a part time distance correction, although she claimed not to feel the need of one. Her phorias were normal but her ductions were again low.

Oculo-prism treatments were again prescribed along with myoculator exercises, these being given at the same time as the treatment. Six treatments and the new correction again put the case in splendid shape, she being able to read, "half a novel in a night" as she enjoyed telling my secretary.

Case 7.

Patient, Mr. G. S. J., age 30, in 1919, at time of first consultation. Occupation, Pullman Porter. Patient complained of an inability to read with comfort while on the train, his run being from Minneapolis to St. Louis, a 22 hour working period with but comparatively few stops. Reading in his boarding house did not materially bother him it seems, but any near point work, some of which had to be done on a moving train, did affect him usually causing a dull frontal headache and a twitching of the lids.

His health was perfect, the case history showing him free from venereal disease or anything else to which I could attribute his trouble. He had never before experienced any eye discomfort and his acuity of vision was normal O. D., or O. S.

The external ocular inspection showed nothing of great interest. His eyes were large and well formed. The versions good. No lack of symmetry and the intraocular tension, normal. There was no swelling in or around the lacrymal apparatus nor were there any excretions. The conjunctiva was clear as was the sclera, which was light in color for one of his race. The lens was transparent and the cornea was free from scars and opacities. There were no irregularities of the Iris, it being deep brown in color. The pupil was large and reacted normally to both light and accommodation.

His fields of vision as charted with a perimeter were found to be normal, both for size and color.

The ophthalmoscope showed lens, aqueous and vitreous free from opacities and the fundus of both the right and left eye normal in color and contour.

The ophthalmometric findings O. U., showed the radius of the cornea in m/m with the Universal Ophthalmometer in the secondary position to be 7.9 there being no malformation.

Skiametry static, working distance at one meter, showed a perfect point of reversal with a plus 1.00 D. Sph., before each eye, the dynamic findings with fixation at the same working distance indicated an acceptance of O. U., plus 0.37 D. Sph.

Subjectively he would accept nothing at a distance, a plus 0.25 D. Sph., fogging him to the 20/24 line.

His near point was four inches and his dynamic findings at his working distance of 36 c/m were O. U., plus 0.75 D. Sph., about the normal accommodative lag.

His tonicity tests showed an orthophoria at a distance and his ductions were as follows: Adduction 14 prism dioptres. Abduction 5 prism dioptres.

His color perception as examined with the Edridge-Green Color Lantern was normal.

Here was a case of at least partial convergence insufficiency, but at this time I did not diagnose it as such and after a post-refraction which reaffirmed the foregoing findings I discharged the case saying that I could prescribe nothing which would relieve his symptoms.

Two months later an optometrist of St. Louis prescribed a pair of plus 0.25 D. Sph., for near work which he used with more or less satisfaction until the spring of 1922 when he again returned. His trouble was now worse than before and he confessed that these "St. Louis" glasses had never helped him at all.

I reexamined him, the findings being substantially the same as before, with the exception that his ductions were, Adduction, 10 prism dioptres, abduction 5 prism dioptres. Comparing these findings with those of three years previous, gave me the clue which solved his problem. The diagnosis of a convergence insufficiency was made and oculo-prism treatments were prescribed, the glasses being discarded. These treatments were given just prior to my receiving the first model of the new Kratometer, the technic at that time being quite crude, I having to rely upon the rotary prisms supplemented by a set of loose prisms, along with an old second-hand model of the Hazen instrument constructed some 30 years before. The treatments also had to be given this patient at intervals between his trips, yet at the end of the second trip, some four treatments being then given he came into the office, well pleased—sure, even at this early date that the treatments were going to be effective, and that they were the thing he needed. In all, some 18 treatments were given which gave him a splendid convergence reserve. He now "felt fine," and did all the reading he wished in his spare time on the train. In fact I remember him saying that he was thinking of starting studying for the Ministry. He was then 33 years of age.

In June of 1923 I received a card from him saying he had been transferred to an Iowa-South Dakota run and was unable to return for another examination which he had been instructed to do at this time.

He came in, however, in January, 1924, saying he believed he should be reexamined again and indicating somewhat similar symptoms as those complained of before. The examination was made and disclosed nothing new. There was no refractive error but his convergence reserve was gone. His near-point adduction was but 15 prism dioptres. He spent a week in the city and I gave him two short treatments each day, 9 A. M. and 5 P. M., and at the end of this period he was again in good shape, his near point adduction having increased to 45 prism dioptres, and his symptoms having disappeared.

The effect of these treatments lasted him until February, 1926, a period of two years and two months. At the end of this time he again noticed that in making out his reports and doing the reading he customarily did his eyes would tire. A complete examination again revealed only the convergence insufficiency, all other factors being normal and oculo-prism treatments were again resorted to. His adduction increased rapidly, the complete record of the treatment follows:

Adduction at 6 Meters

Treatment Number	Start of Treatment	Finish of Treatment
1.	12 P.D.	22 P.D.
2.	14 P.D.	30 P.D.
3.	20 P.D.	36 P.D.
4.	28 P.D.	40 P.D.
5.	28 P.D.	44 P.D.
6.	30 P.D.	44 P.D.
7.	36 P.D.	50 P.D.
8.	40 P.D.	55 P.D.
9.	44 P.D.	55 P.D.

Adduction at 36 c/m

Treatment Number	Start of Treatment	Finish of Treatment
1.	14 P.D.	18 P.D.
2.	14 P.D.	18 P.D.
3.	18 P.D.	24 P.D.
4.	20 P.D.	28 P.D.
5.	24 P.D.	30 P.D.
6.	30 P.D.	36 P.D.
7.	32 P.D.	40 P.D.
8.	32 P.D.	45 P.D.
9.	36 P.D.	45 P.D.

He having a normal convergence re-

serve at the end of the ninth treatment, he was discharged with instructions to return at the end of two years or sooner, should the convergence insufficiency again return, or should any of his old symptoms bother him.

Case 8.

Patient, Mr. C. M. McL. Age 32. Occupation, Mail Carrier. Symptoms: difficulty assorting mail. Eyes would become tired and at times he experienced dull intraocular pains. He came to me first in July of 1924.

His chart showed no immediate illness, nor any serious illnesses at any previous time. His weight was normal and he claimed his health was good. His teeth were in splendid shape as was his nose and throat. There were no catarrhal symptoms, a thing very prevalent among those whose work is largely of an outdoor nature in Minnesota. He had had an insurance physical examination less than a year before and had also had his teeth examined and cleaned in May of the same year.

The ocular examination disclosed nothing of interest except a decided convergence insufficiency. His eyes were free from any form of pathology, and there was no refractive defect. He had normal fields of vision and normal versions, the phoria tests indicating an orthophoria at both distance and near.

Oculo-prism treatments were prescribed, the treatments to be given three times a week for a two month period. These treatments at once gave him relief from the symptoms and as his convergence reserve increased his ability to do prolonged near work was enhanced. The patient was discharged after the eighteenth treatment and continued his work with comfort until January, 1927, when his symptoms returned.

A complete reexamination disclosed a similar condition as was found in 1924 and oculo-prism treatments were again resorted to, five treatments being given. His ductions increased rapidly as the following table will show:

Adduction at 6 Meters

Treatment Number	Start of Treatment	Finish of Treatment
1.	12 P.D.	16 P.D.
2.	15 P.D.	24 P.D.
3.	20 P.D.	36 P.D.
4.	34 P.D.	50 P.D.
5.	42 P.D.	55 P.D.

Adduction at 36 c/m

Treatment Number	Start of Treatment	Finish of Treatment
1.	12 P.D.	18 P.D.
2.	20 P.D.	32 P.D.
3.	24 P.D.	40 P.D.
4.	36 P.D.	55 P.D.
5.	50 P.D.	60 P.D.

He again was able to do his near point work with ease and was discharged with instructions to return for a post-refraction in one month. This he did his adduction at a distance being 52 prism dioptres and at the near point, 36 c/m, the working distance in his case, it was 55 prism dioptres.

As this is a case of reoccurring convergence insufficiency, he was instructed to return in a year for what will be his fourth examination. The prognosis being that by this time his adduction will again be low and that his convergence reserve will require the stimulation which can only be given by means of oculo-prism treatments.

Optometric literature contains but little on the subject of Convergence Insufficiency. Optometrists such as Sheard, Robinson, Steinfeld, Higley, Peckham, McFadden and others, as well as ophthalmologists such as Savage, Maddox and Hazen have written much regarding exophoric conditions and imbalances of the recti muscles which cause the various phorias, but little or no mention of a true convergence insufficiency is made in their works.

A true convergence insufficiency is one in which the patient's convergence and accommodative balance is normal for a near point work of perhaps a few moments' duration, but is also one in which the convergence is unable to keep up with the accommodative powers over an extended period of time.

This being true, it naturally developes that but few cases of true convergence insufficiency present themselves. The majority of cases in which the nerve innervation requires stimulation by means of oculo-prism treatments are cases in which there is no apparent normal balance between accommodation and convergence. Cases for instance in which the patient has some decided refractive defect which even when corrected will not restore the balance between accommodation and convergence, or cases where an inability of one or the other of the

recti muscles to function properly makes the ideal orthophoric condition impossible. On the other hand a true case of convergence insufficiency is a normal case in every respect except that the internal recti muscles lack sufficient innervational reserves to enable them to do prolonged near point work.

Now in most of these cases of convergence insufficiency the writer has found that oculo-prism treatments will entirely relieve the condition, leaving the patient permanently improved. The writer has had a number of these cases during the past seven years and has treated these with marked success. However, our prognosis must be carefully made. During this period the writer has treated the eight previously recorded cases all of which have had from two to four treatment periods.

These are cases of Reoccurring Convergence Insufficiency. The writer has found but eight of these out of some 9,500 refractive cases of all kinds. These cases are unusual inasmuch as the innervational reserves built up by the oculo-prism treatments seem to be gradually dissipated until an actual insufficiency again exists. In each of these cases of reoccurring convergence insufficiency the writer was careful to keep the most painstaking records. The cases were all thoroughly examined on two occasions before each diagnosis and once again before each case was discharged. Care was taken to eliminate as far as practical the possibility of other health factors entering materially into the case. Teeth were carefully examined as were other areas of possible foci of infection. Physical examinations made where seemingly necessary and a record kept of all findings which might influence in the slightest degree the health of the patient.

The accommodative factors of each of these cases was also carefully taken into account, the writer recording the data of the subjective positive accommodative tests and the patient's near point of accommodation on many successive office calls, to reassure himself that in each case the accommodative factors were functioning as they normally should, and not in some noticeable way at least, effecting the convergence reserve.

The treatments prescribed in cases of this type were, as already mentioned, first given with the aid of the rotary prism, loose hand prisms, and an old Hazen instrument with but a single side and a single form of plano prisms. Later on the technic improved and the customary treatment routine as now employed is as follows: First, the tonicity tests are made with fixation at six meters and next at the patient's working distance, the findings being recorded. Second, an adduction test is made with data recorded, the test being made as before at both six meters and the near point working distance. The findings being the maximum prismatic power registered base out, just preceding diplopia. Third, the myoculator is employed, a horizontal action first and later the rotary or rotating action, the fixation being the complementary colors viewed through the blue-green and red glass shield, thus developing the fusion faculties. This the writer has found to be quite stimulating and while he has had little success with the instrument as a unit by itself for treatment work in cases of this kind he has found it a valuable aid, it being used in conjunction with other forms of technic. Fourth, the patient is given a book to read while using a pair of base out plano prisms, usually starting with O. U. ½ degree and increasing gradually as the reserve developes until a pair of 2½ degree prisms base out are in use. In cases where a reading correction is needed this is incorporated in the trial frame along with the prisms. This prismatic near point correction is used from ten to fifteen minutes daily while the treatments are in progress. Fifth, the rotary prisms are next employed. The fixation being first at six meters and later at thirty-six centimeters, or the patient's working distance. During the early treatments at six meters a large letter E is used as a fixation object and later a row of smaller letters 20/40 in size. No blurring is permitted, the patient being instructed to indicate at once should any fogging of the letters take place. The prisms are in each case rotated slowly base out until a diplopia takes place or until the fixation object becomes blurred. The maximum prism power overcome in this manner is also recorded. At the near point the fixation object consists of several lines of twelve point type, of a rather

bold face. Sixth, the kratometer is next employed, the same fixation objects being used at six meters as was used with the Rotary prisms. The near point work is at times supplemented with the Wells Cards and other similar fusional development devices. Seventh, the phoria tests are again made and the findings recorded. A treatment of this kind taking about thirty minutes.

Conclusions.

The review of the treatment records of these eight cases of Reoccurring Convergence Insufficiency brings forth the following conclusions:

First: That the finding of an accommodative orthophoria is no proof of a convergence sufficiency.

Second: (a) That a convergence insufficiency is possible in a person of good health, and (b) That a convergence insufficiency is not necessarily the result of a foci of infection.

Third: That in an otherwise normal patient the necessary giving of oculo-prism treatments to innervate the internal recti muscles will not necessarily affect the accommodation.

Fourth: That it is by no means true that once a convergence reserve is established that it will or can be maintained.

AN ESOTROPIA CAUSED BY A BRAIN TUMOR

Walter B. Lyon, Opt. D.,

Albert Lea, Minn.

The case is at least at first a simple one in its outward appearance. January 3, 1927, a girl of fifteen, a junior in high school, came in complaining of pains in her forehead and in and about her eyes continuously. Rest gave some relief. No other history of importance was recorded.

Visual acuity 94%. Pupillary reaction to light good. Static Retinoscopy, distance at 40 inches, gave Plus 2.50 sphere with Minus .50 cylinder, X 180. Left Plus 2.75 sphere; Dynamic; Plus 3.50 sphere O. U.

Correction applied: Right eye, Plus 1.25 sphere giving visual acuity 87%. Left eye Plus 1.50 sphere gave visual acuity 87%, O. U. 94%.

Ductions and tonicity tests were: Distant Add., 32 P. D. Near Add., 18 P. D. Distant Abd., 10 P. D. Near Abd., 18 P. D. Distant Esophoria, 5 Degrees. Near Exophoria, 3 Degrees. No Hyperphorias.

Ten days after application of correction, pains not entirely relieved. Seventeen days after, patient returned with the following history:

Sees double continuously at close range, slightly at distance; worse in bright light. Had little control to turn left eye out. Reading not blurred, though double, causing extreme nausea. Positively no nausea, discomfort or blur if the right or left eye be covered separately. Her eyelids drooped somewhat, giving her a very drowsy appearance, the left more so than the right. Fundus apparently normal; Media clear.

Visual acuity with the correction applied could not be improved upon in any way. The muscular test proved as follows: Distant Add., 32 P. D. Near Add., 28 P. D. Distant Abd., 12 P. D. Near Abd., 0. P. D. Distant Esophoria had increased to 19 degrees. I could not measure the amount of Esophoria for reading as at one moment it would be one thing and at another it would be something else. Within another two or three days the Esophoria had become Esotropia for both near and far, confirming a growing suspicion that here was a paralytic condition, due to pathological changes beyond our control.

Due to the very unusual symptoms, I advised a complete physical examination by a physician. This was done and the patient was watched for a few days. Our local physician found nothing wrong with the abdominal tract nor with the lower spinal column, but found some nerve irritation at the base of the skull; Occipital area and at the right of it. Patient was referred to Rochester. The Mayo Clinic examination showed that there was probably a tumor of the brain. This tumor was so located as to affect the patient's Optic nerve through pressure, which

accounted for the Esotropia and all of the other symptoms. Advice given was that probably an operation would prove beneficial, but that most likely it would be fatal and that it was but a question of time anyway. Patient was sent home to be watched by the local physician. Esotropia continued to grow worse, though each eye could be turned in, up or down, monocularly; while binocular vision was impossible because of constant diplopia; a fact that re-acted through the whole nervous system through reflex only; giving extreme periods of nausea at those times when covering was removed from one or the other eye. The tumor was the cause also that the left limb could be pushed out of bed but could not be drawn back; this later improved. The left arm could not be moved without the help of the right, the fingers flexed (claw-like) and could not be changed voluntarily nor involuntarily and never did improve.

The patient died March 1, 1927, 3:00 P. M., having gone quietly to sleep at noon—never knowing these facts.

ELEMENTARY PHENOMENA OF LIGHT FROM ROMER TO RELATIVITY

By William H. Blakey, M. A., B. Sc.

from the

British Journal of Physiological Optics.

The tendency for lecturers is to select a certain aspect of the subject and present it in considerable detail. Instead of taking such a horizontal cross-section, I propose to run a vertical through the subject, touching upon the prenomena much in the order of their historical development, thereby restoring some of the perspective which more detailed and intimate consideration is apt to obscure. Perhaps no time is more suitable for such a recapitulation of the fundamentals than the present; for within the last few years new conceptions have arisen which are sufficiently far-reaching to compel a most searching re-examination of the basic beliefs of the scientist. The new world to which these conceptions seem to provide the key manifest such tremendous possibilities that it would be of no small use to re-trace the outline of past progress as a preparation for the better understanding of the new.

In the first place, the simple facts of reflection and refraction gave rise to two theories as to the nature of light. The first is known as the emission theory, and was sponsored by Newton. Light was held to be an emission by a source of small particles of corpuscles of actual matter which shot across space and crowded into the observer's eye in their millions and billions per second. Reflection was explained by the "bounce" of these particles from the edge of the new medium; refraction—for example, the nearer approach to the normal on entering a denser medium—by an increased "attraction" by the medium and the quicker rush towards it. The opposing theory was advanced by Newton's friend, Huyghens. He regarded "light" as the result of energy transmitted from a source by waves in a medium, much as "waves" can be passed along a waving rope or across a fluid surface. The medium itself does no more than oscillate about a given position, but the impulse travels from source to object by means of the motion. Huyghens was thus forced to assume the existence of some medium in which to have the waves, a medium quite impossible of perception by our ordinary senses, yet everywhere existent and permeating the inmost recesses of every atom in the universe. It almost seemed as if he had set himself a bigger problem than the one he had explained, but accepting the idea as tenable for a moment, one could get a consistent explanation of reflection (again by a simple "bounce"), and of refraction (by supposing that the speed of flow of the energy was slower through a denser medium).

There was thus a chance of deciding

between the theories, for Newton's idea involved the necessity of light travelling faster through a denser medium. But it was very long before anyone determined the speed of light in different media. In the absence of such information, the emissionists rather triumphed; moreover the wave supporters had to explain certain disturbing apparent contradictions between the behaviour of sound waves—known to be waves—and that of light.

But about 1800 it was the turn of the emissionists to get a shock. Two rays of light originally derived from the same source were made to cross one another. The result was an alternation of double intensities and zero intensities which could only correspond to the crests and troughs of two crossing waves, and were quite unexplainable on the emission theory. Moreover, it was demonstrated that there was no real discrepancy between the behaviour of sound and light waves, but that what had appeared so was merely a result of the vast difference in the lengths of the two kinds of waves. These results swung things round in favour of the wave supporters, who reaped a further triumph when in 1850 Foucault demonstrated that the speed of light was less in denser media, thus furnishing the crucial test which had been sought since Newton's time.

Much interesting work has been done on the velocity of light. The earliest research was that of Romer in 1675, who observed that the eclipses of Jupiter's satellites were 1,000 seconds later when the earth was at its farthest from Jupiter than when it was at its nearest. The extra time must have been consumed by the light in traveling the extra 186 million miles across the orbit of the earth: hence the velocity must be 186 thousand miles per second. A further determination half-a-century later, by Bradley, depended on the alteration of the angle at which light rays descended a telescope, due to the earth's velocity. There were astronomical methods. In 1849 Fizeau contrived the first method of direct measurement on the earth. Light was sent several miles and reflected back, but a rotating toothed wheel crossed the path of the returning ray and according to the speed of the rotation of the wheel—blocked it or let it through. Shortly afterwards, Foucault employed a similar method, having, however, a revolving mirror which slightly displaced the image by the time the light ray got back from its journey.

The phenomenon of the visible spectrum should be borne in mind. A ray of light passed through a prism is broken up and spread out in a coloured band, the colour being determined (as is the pitch in sound) by the wavelength, which ranges in the case of visible rays from 4,000 to 7,000 ten-millionths of a metre. Any element present in the source of illumination is apt to write its signature in the spectrum by causing the appearance of a characteristic line across the spectrum in a definitely measurable position. By this means one can detect as little as a fourteen-millionth part of a milligram of sodium in the source, and can tell the composition of distant sources such as the stars. By holding different coloured bodies in different parts of an actual spectrum, it may be seen that colour is determined by a body reflecting certain selected rays and absorbing the rest. There is a difference between mixing yellow and blue paints—a mixture of absorptive qualities which yielded green—and mixing yellow and blue light—a mixture of real colours which gave faint pink.

A light streaming over a sharp edge at a distance casts a shadow, but not a sharp one. The borderland is occupied by a series of light and dark bands, owing to diffraction. This "scattering of light" by obstacles in its path accounts for various phenomena—sky effects, the invisibility of stars and solar prominences during daylight, the appearance of a black sky on a planet with no atmosphere, etc.

A ray of light passed through a crystal of calcite gives rise to two separate and distinct refracted rays, the extra one being a "polarized" ray. Polarization shows light to consist of transverse vibrations, and such a crystal as calcite arranges all these vibrations so that, instead of being in all planes indiscriminately, they are all in the one plane. The fact that this plane can be rotated by the influence of a magnet establishes the fundamentally electro-magnetic nature of light.

More modern research, having adopted the wave theory, has been

much concerned to establish the real nature of the conception on which it rests—the conception of the ether. If it exists, it certainly has an extraordinary collection of qualities, but it ought to be possible to estimate the speed at which the Earth was drifting through it. For, if light signals were sent in a certain direction, and then in a direction at right angles to it, then in one case the light would be perhaps in the direction of the stream and in another case across it, and the difference in the time of return of these signals should reveal the rate of progress of the stream. Forty years ago, a famous experiment revealed the fact that there is no such drift at all, i. e., the Earth is not moving through the ether. More recently, however, this impasse has been apparently got round, for it appears that the contradictory result arises from the extraordinary speed of the agent employed—i. e., of light signals. It has been established that the velocity with which an observer is himself moving affects any measurements he might make—a result undreamed of before the present century. The measurements of time and space made by an observer will depend on the ratio of his speed to that of light, and the reason why such a state of affairs had not been understood before was that any speeds with which we are familiar, even the greatest, are practically negligible, compared with the colossal speed of light. It has become evident that the three dimensions of space are not sufficient to fix an object; the time of the object's being at that place is as important a dimension as any of the space co-ordinates. This was not fully appreciated previously, for while we can take any chosen position in space, we are being carried irresistibly and involuntarily along the time axis and are relatively at rest with respect to the movement of time, for we are carried along with it.

The velocity of light seems indeed to be the one unchanging standard in the universe. All motion, form and figure change with the position and motion of the observer, and the most conflicting reports of phenomena can be reconciled by understanding differences, perhaps sudden, in the point of view of the observer—differences of which he is perhaps himself unaware.

Beings who knew but two dimensions, but who were planted on a three-dimensional object, such as a sphere, would find many apparent contradictions. Unable to realise the idea of a sphere at all, they would be hopelessly puzzled to account for the fact that by following two diverging, apparently straight meridians of longitude from the South Pole they would meet again at the North Pole. No Euclidean conception could help them, and they could only conclude that their space was a curved one—warped in some way. In the same way, our three-dimensional minds are being educated to believe in a fourth dimension, and the phenomena there met lead us to a similar conclusion. The curve, and not the straight line, would seem to be the natural path, though the "curve" be almost infinitesimally minute. The presence of matter disturbs the surrounding space-time conditions; hence the disturbing or "bending" of the direction of a light ray passing the sun. It is also shown that the mass of a body varies in proportion to the square of its velocity. For example, a pound weight moving at the speed of the earth (18 m.p.sec.), "weighs" really 1 pound plus one 200-millionth of a pound; at a velocity of 161,000 m.p.sec., its mass is 1½ lbs., and at the speed of light its mass is infinite. Faster than this nothing can go.

The final speculations as to the nature of the universe make it out to be a spherical shape through which all our worlds may be moving with varying mass and velocity, undetected by us because all our standards of measurements change with us. Out of the space continuum of this universe we never move, however. Its measurements are something of the order of 100 million light years in diameter, and a billion times the volume of the Milky Way. Of other possible self-contained universes beyond and outside ours we have as much chance of knowing as two-dimensional inhabitants of parallel planes would have; just as they cannot negotiate their extra dimension, so we can hardly hope to overcome the limitations imposed on us by ours.

ON THE BAGWELL THEORY OF NON-PATHOLOGICAL NYSTAGMUS

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I have read with great interest the well-written article of Dr. W. Bagwell of South Boston, Virginia, in the Optical Journal of August the 4th on the subject, "Refractions in Nystagmus Cases." The subject is treated well with knowledge and understanding. But I disagree with him in some things.

Excepting the pathological cases, the patient is not as a rule greatly inconvenienced by the existence of this condition although it is associated very often with imperfect vision. The etiology of Nystagmus is very rich in its diversity of possible causes. Some authorities think that in the non-pathological cases it may be due to a "weak, impaired, or undeveloped fusion faculty." The author of the above mentioned article takes exception to this statement and says, "A surmise or theory that lends itself a bit more readily to the requirements of the case (non-pathological) and sustained by rather better logic would be the assumption that nystagmus is the result of a strong and insistent fusion combined with the absence of a macula lutea."

As far as this discrepancy is concerned, it seems to me it may be due more to a faulty statement of words than the idea expressed. The authors who ascribe nystagmus to "impaired or undeveloped fusion faculty" may actually in reality mean "impaired or undeveloped agents of fusion." Which then would mean exactly the same as the idea of Dr. Bagwell. Because if fusion be undeveloped there would not be any strong activity on the part of the fusion centers to accomplish something there is no "request" for. Nystagmus in non-pathological cases, the way it looks to me, is more the result of weakness and inability to maintain fixation combined with a strong fusion sense.

But what brings to the author's mind the idea of the absence of a macula lutea? Let us suppose, for the sake of argument, that the macula lutea is present. In binocular single vision it is necessary that a perfect coordination of anatomical, physiological and neuro-psychological agents should exist. If any one should be at fault the exertion of the rest has to increase in order to supply the sum in total of nerve energy for a constant and continuous supply and there will not be noticed any deviation from the normal but it may happen on the other hand that only by "spasmodic intermittent" straining will they be able to accomplish their task and then the result may be an oscillation of the eyeball called nystagmus.

If, as Dr. Bagwell claims, there is an absence of the macula lutea, then in the cases under discussion, that would naturally have to be a congenital condition and then there would either be developed in time a false macula or the image falling on corresponding spots inside the fusion area would satisfy the want for binocular singular vision. True, a little blurred, but still binocularly single, and the only action that we would deem possible and probably in this case would be a rearrangement of the focusing apparatus bringing the ciliary muscles into play. Why then the nystagmus and the lateral (or vertical) shifting of the image?

Then Dr. Bagwell advances another surmise—"the macula lutea is not a single spot but a line or measureable area—" Now, according to anatomy and histology, the construction of the fundus is so, that as we approach the macula there is an increase in cones and a decrease in rods, and at the fovea —the center of the macula—the point of the keenest vision, there are only cones and no rods at all. We can conclude then that, in the case of absence of a macula, a place on the retina where the number of cones are most and the number of rods the least, would naturally in time be developed as a false macula. Of course it may be possible that the macula so created, should take any shape, let us say, elongated. If then the whole macula area

is not of a uniform sensitiveness then again in time the most sensitive part would have been specialized. On the other hand, if the case should happen to be one of uniform sensitiveness why then the oscillations? Any corresponding points in the macula area would give same clearness of vision. Where is there the necessity for the fusional centers to exert themselves? And for what reason?

Dr. Bagwell, in order to substantiate his surmise that a like macula will cause nystagmus, takes as example, the physical law of gravitation, which to my mind seems to be very much amiss, to say the least. He compares the retina to a spherical bowl and—but let me quote this passage in order not to misrepresent. Here is what Dr. Bagwell says, "Imagine a small shot dropped into a spherical bowl where gravitation naturally and promptly places it at the lowest point where it quietly comes to a complete stop. Now imagine this same bowl with a flattened area at the bottom. The shot reaching the bottom will continue for a while to wander. Similarly when an image falls on a concentric portion of the retina, the increasing sensitiveness of this membrane macula-wards gravitates the image toward the point where it promptly comes to a complete stop.— But if there is no macula lutea, so that the macula region and circumadjacent area are of similar and equal percipiency, or if the macula lutea is a line instead of a spot the image on arriving will swing back and forth across this portion of the retina. The shot wanders across the plane surface of the bottom of the bowl."

I cannot understand how the writer could so disregard anatomy, physiology and psychology, nay, so entirely ignore them, as to use such an example. In my article, "Vision and Seeing," written for the American Journal of Optometry, I brought out the following thought: "Facts in themselves are stupid things until they are linked together, and, only when they are the result of human experience, tested and set in order, do we have what is known as science or knowledge. Now the latter, when intelligibly stated in terms of human experience becomes truth. But truth is never complete, it provides for its own further extension. But individuals naturally grow impatient with the slow progress of testing realities and seek far swifter answers to the problems they confront. They would hurry up matters, theories and suppositions, not by science but by something that looks like it, and is therefore to their mind almost equally good. They care nothing for the difference between analogy and chance resemblance, and for them homology is fundamental identity."

With all my respects to Dr. Bagwell, I must conclude that his example is well characterized in the above cited paragraph. Can one compare the comparatively simple phenomena of physics—gravitation—with the complex anatomico —neurologico — physiologico—psychological act of binocular single vision? Are the laws of physics —the laws of gravitation in this case—analogical to the laws of vision? The shot will role due to the "resolution" of physical forces and the action of the laws of gravitation upon it; but it is the eye in the case of nystagmus oscillating due to same causes or analogous causing laws? Preposterous!

In the case of "line-macula" where, according to Dr. Bagwell the sensitiveness is presumed to be same all through, why should there be a nystagmus? No matter where the image impinges upon the retina, as long as it is in the area of like sensitiveness, visual accuracy and distinctness will be the same. There is no cause or reason why nerve centers should be called upon to discharge supplementary nerve to impair vision. Everyone understands that when the eyes are focused on a single point its image is clearer and vision less impaired than when the eyes keep on oscillating. It seems unreasonable to believe or even suppose that nature will discharge extra nerve force to defeat its own purpose—that of clear binocular single vision.

We can not, therefore, accept Dr. Bagwell's theories that in the non-pathological cases, nystagmus is caused by the absence of a macula lutea or by a line-macula. They are inconsistent with accepted laws of nature and are contrary to logic.

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THE AMERICAN ACADEMY OF OPTOMETRY AND THE A. O. A.

Far from believing that there need be any antagonism between these two organizations, I shall attempt to show that one is the complement of the other and that each should be cherished by Optometry to fill distinctly different but equally important needs.

That which is known as "politics" plays the leading role in the American Optometric Association while higher educational matters are crowded into the background. This is a statement of fact, not adverse criticism.

To such an organization as the A. O. A. politics is the life-giving principle; the apparent internal strife is really the cementing influence; the wire-pulling develops a sturdy group who out of sheer love of the game, fight to guard our borders against unjust encroachment.

Let us not forget it was politics that gave us political weapons with which to successfully attack legislative inertia; politics which fought ruthless opposition and gave us optometry laws; politics which gave us optometry courses in the Universities and our optometry schools; politics and politics alone which will maintain our standing while we are passing through the various stages of development.

Let us not squabble over the fact that too much politics may have given us some unwise legislation—that is not the fault of the instrument but of the manner of its use. We must recognize the principle that any agent which has power for good has inherently power for evil. Let us see to it that this powerful agency be used skillfully and that it may be used skillfully by specialists. I contend that the A. O. A. should be developed openly and without sophistry along political lines without being hampered by more or less abstract educational issues which should be cared for by another body of specialists.

I for one have never lost faith in those who have been elected to guide and guard our political fortunes and without rancor I state I have more faith in our political leaders than I have in our educational leaders, among

whom I place myself, as matters stand today.

Our political leaders are fighting stock, have had experience, have shouldered heavy responsibility, have specialized in this work and have learned to dominate. Our educational leaders have been held in leash, not to say submerged.

Political or legislative issues as a rule are imminent while educational issues as a rule seem academic and not imminent and therefore we must not blame those on the firing-line for concentrating on the more insistent issues.

Any group of men properly developed to conduct the political affairs in Optometry most likely will lack the qualities needed to conduct the educational affairs and, though trite, it is just as true that any group developed to conduct the educational affairs in Optometry will fail lamentably in the political lists.

Why, then, in spite of the teaching of the past, do we continue to look for a group in the A. O. A. capable of handling successfully both sets of problems? Show me a high type political executive and I will show you one who will but weaken his true effectiveness by diverting any considerable part of his activities to higher educational problems and show me a truly capable educational leader and I will show you one who will have the good ship, A. O. A. on the rocks, politically, in jig-time.

Therefore, after thirty years of labor in both fields, I accept the obvious truth that optometry needs two strong, active, independent agencies, one, the A. O. A., to control its political and general activities and another, the American Academy of Optometry, to study, develop, and direct solely its purely higher educational destinies.

To what other conclusion can any open-minded man come who has witnessed the birth, troubled existence and death of the Physiologic Section and all other educational bodies that have attempted to grow under the smothering influence of the A. O. A.?

On that basis I stand for an American Academy of Optometry built up of local academies, every member of whom must be a member of and loyal to his local, state, and national optometric association and who plays his politics in those and devotes all his attention to purely educational work in the Academy.

This plan for an American Academy and the A. O. A. is not idealistic but offers the practical solution of the present impasse. Everyone of us is interested, actively or passively, in the A. O. A. because our welfare, our personal interest, is inextricably linked with it; hence, we must all stand by the A. O. A.

On the other hand, some of us are especially interested in higher educational activities and we are entitled, I think, to a place to work those out where we neither interfere with or receive interference from the general activities of the A. O. A.

I have found such a haven in the New York Academy and the American Academy and object to having my motives impugned or my loyalty to my city, state, and national association questioned because of membership therein.

McBurnie is a member of the New York Academy of Optometry. Has he served the general interests represented by the A. O. A.? Hoteling, Drakeford, Dilworth, Fisher, Quim, Pratt are members—each has served at least one term as President of the Optometric Society of the city of New York—have they served the general interests represented by the A. O. A.? Woll is a member; has he served Optometry? Roberts, Hirschberg, Graubart, Schollerman, Lyons—Columbia men—are members, have they served the general interests? Hull, Blee, Glyer, Hahn—have I failed to name

any?—and after all, does not Optometry need a body of such advanced ethical men functioning freely and striving to make it easier for others to reach an ethical position from which they will command respect for Optometry as an honored profession lifting it from a dubious trade?

Instead of having the A. O. A. rent in twain, and who fails to note portentous signs, in choosing annually between two presidential candidates and two sets of officers and directors, one standing for political interests, the other for educational interests, I maintain it will be wiser to permit the A. O. A. to select freely its most capable political executives because vital interests must be guarded by them and to permit the Academy to select as freely those who can best direct higher educational interests. Thus Optometry would have two sets of men working in harmony at distinctly different but equally vital phases of her work instead of one set working in the A. O. A. with some of the others out of sympathy if not actively antagonistic. We have two sets of problems, so different in character that the A. O. A. has never handled both successfully. Why, then, if we have two groups who can handle them if given the proper agencies and free scope, should we not provide the agencies, namely the A. O. A. and the American Academy, and permit them to function in their respective spheres independently?

The American Medical Association functions well and works harmoniously with the various Academies of Medicine.

The A. O. A. turning over the higher educational problems to the American Academy of Optometry would see these problems properly cared for by that body, would at the same time rid itself of what is at present a bone of contention, and would still get the benefit of any specialized work the Academy accomplished.

There is not an educator in the country, not a professionally-minded practitioner, not an individual who believes Optometry is essentially a profession, not a single conscientious student preparing to shoulder professional responsibility, who should not do everything in his power to foster the growth of his local Academy and of the American Academy wherein nothing but purely educational activities should be considered and high ethical standards nurtured.

I venture to urge the local academies throughout the country to clear decks for action and enlist under the American Academy of Optometry when it holds its next annual meeting at New York City in December.

Dr. E. LeRoy Ryer.

PRESCRIBE OPTICAL APPLIANCES

There are two words which should be eliminated from the vocabularies of every professional optometrist. These words are both essentially commercial words, and are words which should never be used by one engaged in an office practice of optometry, nor for that matter in any type of an optometric practice. They are words which are properly used by dispensing opticians but must never be, in our judgment, used, by the refractionist himself, and should he do his own dispensing he would nevertheless find no occasion to use the terms.

The first of the words I believe it wise to eliminate is the word "sell."

Now, let it be clearly understood in the first place that no professional man has anything to sell but his services. Material things like pills, teeth or optical appliances are always prescribed. They are not sold in the accepted sense of the word, for, to sell a thing requires the consent of the buyer, the decision being left in his hands. As far as the optometrist is concerned, this decision on the part of the buyer or in this case the patient, is waived, as it is in all professional office practices, the mere presence of the patient in such an office is an admission on the part of the patient that he will accept anything within reason which is prescribed. Nothing is sold!

Optometrists who practice in this manner, upon finishing a refraction, merely say to the patient: "Now, Mrs. So and So, I am prescribing a correction for you to use at such-and-such times for the following reasons": and give them in a straightforward technical manner. You, as the refractionist, are in this way in command of the situation at all times and it is essential that you be, if you are to keep the respect of the patient.

The second word I believe it wise to discard from the vocabularies of all optometric practitioners is the word "glasses." This may come as rather a shock to many of our practitioners who are spending most of their working days doing something with reference, at least, to glasses. But let's stop for a moment and review the word and in general the subject. It is my belief that the word glasses is one of the stumbling blocks of optometry today. Far too many of our practitioners think only in terms of glasses and far too many of our patients still make appointments "to get glasses," the glass part being apparently the important thing. Now, the glass by itself is of little or no importance at all, unless it has been skillfully prescribed. Of what value is an elaborate dental plate unless it has been accurately made to fit a certain oral cavity? Of what value is an elaborate pair of glasses unless they have been carefully prescribed to relieve certain visual defects of some particular person? The material is incidental to the work it is to do. And it is optometry's mission to get this fact home to the public. As soon as the glass wearing public recognizes this fact, more care will be employed in making the choice of their refractionist, and less thought put in by the patient, at least, on the details of eye-glass construction.

Now, just how can we go about stressing this point, as professional men without actually bringing up the subject? This is comparatively easy. After informing the patient that you were prescribing a correction, etc., one can simply go on to inquire as to any particular tastes the patient may have regarding the material to be used. Very few patients fail to grasp the significance of this statement and in most cases the answer will be something as follows: "Well, Doctor, I suppose you know best as to just what would most satisfactorily do this work and while I rather preferred so-and-so in the matter of a frame, I must of course let this to your judgment." Thus it is usually accomplished, though the writer frequently tells his patients that as long as the material used is of the best, he has no other interest in it, as it is being prescribed merely as a therapeutic measure. In this way the optical material is regulated to its proper semi-important place and your skill as an optometric practitioner is brought to the foreground.

For you optometrists who are still guilty of using these terms, "sell" and "glasses," we can only say to you: Stop selling glasses and start prescribing your services, through the means of optical appliances made of optical material, and notice the difference in your patients' attitude towards you.

C. C. K.

PUBLIC RECOGNITION OF THE OPTOMETRIST

From time to time complaints reach us from different sections of the country stating that the word "optometrist" is practically unknown and certainly unused by the great majority of the public. This is true despite the fact that optometrists prescribe about three-fourths of all the material used. The question to be raised is, not who is to blame for this condition, but rather what can be done to remedy it. Just what measures must be taken to fully acquaint the public with the meaning and scope of professional optometry.

The American Optometric Association is putting forth an earnest and serious effort to conduct a national publicity campaign to popularize the professional work of the optometrist, and also the word, but the campaign simply cannot be a success unless the optometrists themselves, the practitioners in every city of the country, will give their fullest support to the project.

Of what value is it to conduct a publicity campaign to popularize the profession and the word "optometrist" when many of the men practicing this profession fail to identify themselves with it. Take one hundred optometrists in most any locality and it will be found that the great majority of them call themselves "optical specialists," "scientific refractionists," "opticians," "eyesight-specialists," "refracting specialists" and many other titles too numerous to mention. Is there any wonder that the public is confused and can not tell just "who is who" amongst the "57" varieties of the same specialty.

The American Optometric Association at its last convention in Washington passed a resolution requesting that all of its members use the word Optometrist only in designating their professional calling. This is a move in the right direction. The officers of the different State Associations and State Boards of Examiners can help very much, not only by bringing this resolution to the attention of the individual members, in their respective states, but in urging them and see to it that they live up to the spirit of this resolution.

J. I. K.

In Memorium

DOCTOR WILLIAM S. TODD, Optometrist

Death has claimed one of optometry's great men. A man whose works will live long and whose splendid deeds will ever be pleasant in the memories of all professional optometrists. Doctor Todd was the founder of the International Board of Boards, an organization composed of members of State Boards of Examiners in Optometry, and one whose splendid work will alalways be a monument to its founder. As Chairman of the Educational Department of the American Optometric Association and later as President of that organization he was successful in doing the greatest piece of educational work ever accomplished by an optometric society, and one which will continue to prove helpful to many practitioners for years to come. He lived, ever working to better his profession, and constantly striving to help his fellowmen, and his untimely death leaves a gap in the ranks of professional optometry which the profession will find it impossible to fill. Doctor Todd died on August 29th, at the age of 54, in his home at Hartford, Connecticut.

C. C. K.

ABSTRACT DEPARTMENT

Optometric and ophthalmic Journal articles and reprints to be abstracted should be sent to Dr. G. L. DuPlessis, 209 Yeates Building, Minneapolis, Minnesota. Only papers of interest to optometrists will be reviewed in this department.

The Snellen Symbol and Visual Value.

J. A. C. Gabriels. Archives of Ophthalmology. Vol. LV., No. 5, pp. 447-452. 1926.

Gabriels believes that the unit of surface and not the visual angle is the true criterion in the determination of the value of vision. By this he means that the actual measure of vision is based on evaluation of the units of surface rather than of the linear units as measured by the five minute angle. This vision value decreases in proportion with the increase in size of surface, as shown by the following chart which he has drawn up.

Visual Symbol of Snellen	Visual Loss in Per Cent.	Visual Efficiency in Per Cent.
20/20	0.0	100.0
20/25	4.0	96.0
20/30	11.1	88.9
20/35	18.4	81.6
20/40	25.0	75.0
20/45	30.9	69.1
20/50	36.0	64.0
20/60	44.4	55.6
20/70	51.0	49.0
20/80	56.3	43.7
20/90	60.5	39.5
20/100	64.0	36.0
20/120	69.4	30.6
20/140	73.5	26.5
20/160	76.6	23.4
20/180	79.0	21.0
20/200	81.0	19.0
20/220	82.6	17.4
20/240	84.0	16.0
20/260	85.2	14.8
20/280	86.2	13.8
20/300	87.1	12.9
20/320	87.9	12.1
20/340	88.6	11.4
20/360	89.2	10.8
20/380	89.8	10.2
20/400	90.3	9.7
20/500	92.2	7.8
20/600	93.4	6.6
20/700	94.4	5.6
20/800	95.1	4.9
20/900	95.6	4.4
20/1000	96.0	4.0
20/1100	96.4	3.6
20/1200 (5°)	96.7	3.3
360 degrees	100.0	0.0

T. O. B.

Suspension of the Fusion Impulse as a Therapeutic Measure. E. M. Alger, Archives of Opthalmology. Vol. LV., No. 5., pp. 438-446. 1926.

Alger suggests the suspension of the fusion impulse in some elderly cases of anisometropia; cases in which both crystalline lenses have been removed after cataract operations; cases of incomplete motor paralysis; cases of convergence insufficiency; or in some cases of motor spasm. He feels that a mistake is being made in our efforts of developing fusion in many of these elderly cases, believing that much better results could be obtained if we would ignore binocular vision and the fusion sense, and train patients suffering from one or the other of the above named defects to see at a distance with the dominant eye and at the near point with the other.

C. C. K.

Glaucoma. Priestley Smith. The Optician (British). June 24th, 1927, p. 330.

According to Priestley Smith, one of the chief of the conditions likely to invite glaucoma is an insufficiency of space between the circumference of the crystalline lens and the surrounding structures. A progressive increase in the size of the crystalline lens, which Priestley Smith has demonstrated, is advanced to explain the greater liability of middle aged and elderly people to the disease.

Primarily, glaucoma frequently attacks small eyes. In such organs, of course, the circumlental space is less. Thus the intra-ocular fluids which are constantly being replaced and which must therefore find an exit from the globe, are impeded in their escape

through the canal of Schlemm. This theory of the cause of glaucoma is described as the Retention Theory.

T. O. B.

Myopia. E. Hippel. Festere zur Jahresfeier der Universitae, Goettingen, 1923.

Hippel claims that the "so-called" school myopia is hereditary and that near work is not a contributing cause. He also maintains that it is not at all necessary that a myope should always be associated with an elongation of the axis of the eye, in view of the fact of the variations of the cornial curvature.

J. I. K.

The Effect of Motion Pictures on the Eye. Guy A. Henry. The Canadian Optometrist. Vol. VIII, No. 12, pp. 345-348. 1926.

Henry, speaking before the Society of Motion Picture Engineers, makes the following suggestions, all of which he claims will be beneficial in conserving the eyesight of the Nation.

1—Eliminate all old, worn film. 2—Proper projection to eliminate flicker. 3—Eliminate all vibration of projection machine. 4—Eliminate lateral movement caused by a vibration of the camera while taking the pictures. 5—Never permit the light from the projection machine to strike the bare screen. 6—Care should be taken to have film in proper focus at all times. In this connection Henry suggests that all motion picture operators have their eyes examined to make sure that they can properly focus a machine. 7—No seat nearer the screen than 20 feet. 8—Seats so placed that to observe top of picture the eyes need not be raised more than 35 degrees from the direct horizontal line of vision. 9—Regrading lateral angle of vision, i. e., the angle to the side. Henry suggests that at the far edge of the screen (the edge most remote from the observer), the angle formed by the screen and the line of vision should not be less than 25 degrees. 10—There should be a reasonable amount of general illumination present at all times in the auditorium where the pictures are being shown.

C. C. K.

A Bifocal for the Sculptor and Painter. E. LeRoy Ryer and E. E. Hotaling. The Optical Journal and Review. July 21st, 1927. p. 19.

Ryer and Hotaling suggest a bifocal for those of our patients whose work at the near point is frequently above the eye level and who find it impossible to use the ordinary type of bifocal lens with the near point focus at the bottom. The change suggested by these optometrists is that the reading or working focus be placed vertically at the right half of each lens and that the distance focus be at the left. The lens is thus divided vertically rather than in the usual horizontal way. The patient wishing to view objects at the near point merely turns his head slightly to the left, the lines of vision thus passing through the right-hand segments of the lens. The reverse being true for distance vision.

T. O. B.

Bifocal Adjustment. P. N. Hansen. The Optician (British). Vol. LXXII, No. 1873, p. 492. 1927.

Hanson advocates the use of small segments for bifocals, claiming that his experimental work has proved to his satisfaction that no bifocal segment, providing it is properly adjusted, need be more than 21 mm. in width.

T. O. B.

SPECIAL REPORT

RETAILING WHOLESALERS

William Smith, Opt. D., D. O. S.
Roxbury, Mass.

This article is written for the purpose of acquainting the profession with a condition which exists today. This disclosure may not be of any avail and my efforts may be wasted, like LaFontaine's "cook" in the fable —"who left the cat in charge of the kitchen while he went to town; on coming back he found the cat devouring a chicken. The cook thereupon reprimanded the cat for its indiscretion. But 'Tommy' listened not, but kept on eating."

Much has been said about this evil, but nothing has been written or done to alleviate the condition as it is existing. Thousands of people are served yearly by these unscrupulous wholesalers, with not much benefit to themselves and much harm to those whose methods are honest and straightforward.

A woman came into my office the other day. "I want to have my eyes examined and glasses made up," she said. "The ones I wear are of not much good now. I got these about three years ago at 'X. Y. Z.' Optical Co. I got them at the real wholesale price. 'X. Y. Z.' is a wholesale concern, as you may know, and they examine eyes, too. All I paid was $4.65 for the whole thing—shell, frame glasses, and a case. They charged me 15c for the case. But these—" (Here she procured another pair, this time a pair of toric lenses mounted in a popular style Zylonite frame. The right lens was cracked. Upon neutralizing, I found them to be O.D.+350 D. Sph. ⊃+175 D. Cyl. × 175
O.S. + 4.00 D. Sph. ⊃+175 D. Cyl.× 155.)

"These I got at Dr. So and So.* For these I paid $6.75. I think he 'soaked' me. I only paid $4.65 in the wholesale house and he charged me $2.00 more. Now, doctor, tell me how much you will charge me for the examination and lenses. I'll use the frames I have. I guess they are all right."

I knew that one who is accustomed to "buy eye glasses" at these two places will never consent to pay my fees for my services. I, therefore, told her that I charge a specific examination fee; and, that the cost of the material will depend upon the prescription that was written. She demanded at least an approximate estimate which I told her, with the result that I naturally lost her business.

This incident set me athinking. I confess that this was not my initial experience in this direction. More than once people told me that they can buy optical material, meaning frames and lenses, as cheap as I can. They told me that they can go to the wholesale optical house and order them. At first I did not pay attention to their boasts. But when people, mere strangers in the optical field, began telling me prices and conditions of war in the trade, I felt this gave me real food for thought. Can't a man make a dispensing sale without telling his "customer" what relations exist between the optical manufacturers, how the prices are, and what the outlook will be? For instance, I learned all this from a person who came into my office to purchase a frame. I asked him five dollars for it, only to be told that he could buy the same frames for about half that price at the wholesale house. Incidentally he told me all he knew about conditions in the optical business. This he told me, he learned from a clerk in the wholesale house where he had his lenses made up a few weeks before.

I can't dictate who should dispense optical prescriptions and who should not. But I certainly can suggest to my fellow optometrists to look around and take notice of those wholesalers who are doing dispensing work at prices Far Below the Lowest Retail Price. I don't expect that these wholesalers should relinquish their rights to whatever retail dispensing they chance to get, although out of fairness to their customers the optometrists and ophthalmologists, they should not compete with them. It so happens that the wholesalers that do retail business are competitors of their own customers. But I demand that out of fairness to business ethics, to the optical trade and optometric profession in general, They

*Note: I do not know what the name of this man's optical establishment is now; he changes it about every month. He changed it four times in six months.

Stop This Dispensing at Cut-Throat Prices. Some of our legitimate practitioners, unfamiliar with the business tactics of these retailing wholesalers, deal with them unawares.

I cannot understand the psychology of these business men. Don't they know that by their methods and tactics they are ruining their own chances. That by their greed for the dollar they are jeopardizing their standing in the trade. To get the 50c profit on a pair of lenses they kill the goose that lays the golden egg. They sacrifice goodwill upon the altar of Mammon.

Retail dispensing belongs to the retail dispenser, just as wholesale dispensing belongs to the wholesaler. The optometrist and the dispensing optician have the prerogative in this field. It is a sort of inalienable right, which no one disputes. They in turn come to the wholesaler to purchase their raw material. Retail dispensing, therefore, comes outside of the wholesaler's business scope. And if he does it he commits an unpardonable breach of business ethics, particularly if he does it at cut prices.

After all, business men like professional men, are bound by a code of ethics. There are things which they may do as there are things which they may not. "That everything is fair in business" might have been all right yesterday, but today, ideas concerning business methods have changed. Even competition is done in nice and gentlemanly manner. There are some things which even the most unscrupulous business men would stop at doing. But some of our wholesalers stop at nothing. This is evidenced by the fact that with one hand they sell the optometrist optical material, and with the other they dispense prescriptions At Less Than Wholesale to whomever comes into their offices.

But that is not all. While they find the optometrists' business very good, and the optometrists' patronage quite profitable, some of these wholesalers, those that have no examining facilities, invariably always recommend the oculist in preference to the optometrist for examinations. Because the oculist send them their recommendations back, while the optometrist, being his own dispenser, does not do so.

Such base ingratitude. One would expect at least some consideration for the profession under these circumstances. The wholesalers are not obligated to send the optometrist business. After all recommendation is a matter of personal choice and opinion, and man can recommend whomever he chooses. But every man is bound morally to have consideration for the one that gives him his livelihood. It is expected of him, otherwise he becomes an ingrate, a low creature who eats from your hand and then bites your finger.

I do not want to appear pugnastic. But how else can we bring to an end this exploitation of our good will? These fellows by their unbusinesslike methods are a detriment to their fellow business men. In the first place, because they are encroaching upon the rights of the other fellow. In the second place, I feel that one cannot give away his services gratis. There is a vast difference between just selling merchandise, and selling service. They sell glasses, while we, as optometrists, sell service. It is the service for which we charge.

You may wonder how one can tell whether a man does retail business in addition to wholesale. He does not advertise the fact on his door, windows, signs or printed matter. This, however, is easily done. In this establishment, the outer office or waiting room has a professional or semi-professional appearance. A fitting table with a complete display of frames and mountings, test charts, both for distance, and near, to check up the prescription, such as are seen in the dispensing opticians' offices. Legitimate wholesalers do not need this display, as they have other means of showing their merchandise, and if they do, it is not arranged in a "service formation" as in the first case.

That something more than just talk has to be done about this, is no question in anyone's mind. We must once and for all draw a line between the retail and wholesale ends in the optical business. (If a wholesaler simply must sell at retail, although there ought to be enough in the wholesale end to keep him busy, let him at least be fair to his own trade, and not undersell.) We must put our retailing wholesalers where they belong. Not so much for our good as for their own as well.

BOOK REVIEW

The City of Open Air and Other Verse. Charles P. Cleaves. Published by the Rumford Press, Concord, New Hampshire. 110 pages. 1927.

While not an optometric text, this small volume of poems comes to us as a refreshing bit of the higher spiritual side of life. This work is of interest to us as optometric practitioners for several reasons. First, the sentiment expressed in the verses themselves is good and the reading of it will materially enrich our lives, the style being one which should appeal to many readers, and in the second place, the work has been done by one of the collaborators of this Journal, Dr. Charles Poole Cleaves, optometrist of Center Harbour, New Hampshire. Doctor Cleaves is a prolific writer, his subjects being both religious and optometric, he serving the people of his territory both as a minister of the Gospel and as an optometrist.

Of the ninety odd verses in the book, "When the Mem'ries Live," "The Village Street," "Somewhere in France" and "The City of Open Air" appeal to the reviewer as the most outstanding, however this is naturally a matter of personal taste and we whole-heartedly recommend this work as one well fit to add to the family library of contemporary American poets.

C. C. K.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

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NORTH DAKOTA CONVENTION

North Dakota passed the twenty-fifth milestone of its progress in optometry when the North Dakota Optometric Association held their annual convention at Minot, August 1 and 2, commemorating the twenty-fifth anniversary of the association.

In his opening address, President L. J. Anderson of Grand Forks reviewed the progress that optometry has made in North Dakota during the past quarter century. He also pointed out the necessity for a well defined, national policy to be followed by state associations and state boards with regard to uniform requirements and practices in reciprocity, classification of optometry schools, etc.

Dr. Roy S. Dean of Omaha, who was featured in the educational part of the program, proved very popular and interesting. His able lectures on illumination, muscular imbalance, etc., were well received.

Other educational lectures on the program were "Afferent and Efferent Physiological Pupillary Paths," by Dr. Lyle Benson, optometrist; and "Pathological Relationship of Teeth and Eyes," by Dr. Abbott, dentist. Both are Minot practitioners.

An essay contest open to North Dakota school children from the fifth to the eighth grades, inclusive, on the subject, "Good Eyes Essential to Success," will be started this fall, as a result of action taken on the final day of the sessions. Prizes totalling $100 are to be offered by the association.

Decision to sponsor such a contest was reached by the convention, following the reading of a paper by Dr. A. S. Anderson of Williston, secretary of the association, in which he discussed the essay subject. The purpose of the essay contest it was explained is "to bring to the children of North Dakota a greater realization of the important part their eyes play in their every day lives, and to acquaint them with the simplest rules of eye care and hygiene." All children

participating in the contest will be entitled to a free examination of their eyes by an optometrist who is a member of the state association. The first prize will be $50, and the closing date of the contest December 24, 1927.

Probably the most important action at the business sessions was the adoption of a new constitution and set of by-laws, and a code of ethics, which will govern the association membership in the future. The constitution revision committee were composed of Dr. Lyle Benson, Minot, chairman; Dr. A. S. Anderson, Williston, and Dr. W. H. Monahan, Minot.

Committee appointees announced by the president at the convention were: Auditing committee: Dr. Andrew Lee, Carrington, chairman; Dr. R. P. Merritt, Kenmare, and Dr. A. R. Hawkinson, New Rockford. Nominations Committee: Dr. H. J. Wagner, Bismarck, chairman; Dr. L. G. Power, Minot, and Dr. R. E. Bonham, Bismarck. Resolutions Committee: Dr. A. E. Anderson, Towner, chairman; Dr. R. P. Merritt, Kenmare, and Dr. H. Kornmesser, Jamestown.

In the annual election of officers, Dr. H. Kornmesser of Jamestown was elected president, succeeding Dr. L. J. Anderson of Grand Forks. Dr. C. G. Hendrickson of Grand Forks was elected 1st Vice-President, succeeding Dr. Lyle Benson of Minot. Dr. A. E. Anderson of Towner was elected 2nd vice-president, succeeding Dr. L. H. Branchaud of Cavalier. Dr. Andrew Lee of Carrington was elected treasurer, succeeding Dr. Elizabeth Roton of Grand Forks. Dr. A. S. Anderson of Williston was re-elected secretary.

Jamestown was chosen for the 1928 convention city, and the dates set for August 6 and 7.

In the second annual optometric golf tournament, Dr. R. P. Merritt of Kenmare won possession for one year of the beautiful golf trophy presented to the association last year by the Riggs Optical Co. Dr. Merritt defeated Dr. A. S. Anderson, runner-up and 1926 titleholder, by three strokes in the 18 holes of medal play over the Minot Country Club course.

A banquet in the Palm room of the Grand Hotel, at which Riggs Optical Co. were the hosts, marked the close of the convention. Dr. Roy S. Dean of Omaha officiated as toastmaster. Entertainment features at the banquet were violin solos by Professor Petrucci of Minot, and vocal solos and duets by the retiring president, Dr. L. J. Anderson, and the president elect, Dr. H. Kornmesser.

MINNESOTA STATE ASSOCIATION OF OPTOMETRISTS' BULLETIN

It has come to the attention of the officers of your Association that many of the members are using different titles to designate the practice of their profession other than the word, "optometry," which is the only term under which we are authorized to practice by law. The use of the many different titles is very confusing and is retarding the public's recognition of optometry.

The American Optometric Association at its last annual convention held at Washington, D. C., in considering this matter adopted the following resolution:

"WHEREAS, In announcement cards, publicity, advertising, etc., many Optometrists employ titles such as "Optician," "Eyesight Specialist," "Refracting Optician," "Optical Specialist," etc., and

WHEREAS, This is deemed to be confusing to the public and does not tend to acquaint the public with the true title of the practitioner practicing under his state license issued to him as an Optometrist only;

BE IT THEREFORE RESOLVED, That it be the sense of this meeting that all Optometrists be requested to use the word "OPTOMETRIST" only in the designating of his or her profession and that this word be used exclusively;

BE IT FURTHER RESOLVED, That the Secretary be instructed to send a copy of this resolution to the secretary of every affiliated state and province affiliated with the American Optometric Association with the request that the state secretary transmit this to the individual members of his state society by mail or through his state bulletin, as well as read same at the next annual meeting of the state or provincial society."

The officers of your Association urge you to abide by the above resolution.

J. I. KURTZ, Secretary.

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